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| EXAMINER ZOLLINGER, NATHAN C | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/596,642

Applicant(s)

SMITH, ALAN

Examiner

NATHAN ZOLLINGER

Art Unit

3746

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-15, 17-24 and 27-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-15, 17-24 and 27-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

Detailed Action

Response to Amendment

The amendment filed on September 4, 2009 has been entered. Claims 12-15, 17-24, and 27-28 have been amended. Claims 29-32 are newly added. In view of Applicant's changes, all previous objections have been withdrawn.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Currently, the Applicant uses the generic title "Pumps" which conveys very little about the subject matter of the invention. A more appropriate title would be "Piston Pump with Cam Follower Arrangement."

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-15 and 17-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, applicant claims that pistons are "free of any spring action." Examiner questions this language since Applicant's piston (24) is, though at a distance, connected with the spring (34) in the sense that forces

from the spring action can be transmitted through the cam follower to the piston. As such, Examiner requests a more precise phrasing such as, "the pistons do not contact any springs."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12-15, 17-18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke et al. (US 5,145,339) in view of ordinary skill in the art.

Claim 12: Lehrke discloses a pump, comprising an electric motor (col. 1, lines 59-61; col. 3, lines 7-8) having a rotary output shaft (14); first and second pistons (34) reciprocable rectilinearly in first and second cylinders (Fig. 1, sleeves surrounding pistons); a constant velocity cam (18) driven by the rotary output shaft; and first and second cam followers (20, 24) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons (Figs. 1, 3), respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons 180° out of phase with one another (Fig. 3a); wherein said first and second cam followers are interconnected by a spring arrangement (Figs. 2-3, 32 or 60) simultaneously urging both said cam followers toward each other to engage the cam

surface of said constant velocity cam; and wherein the reciprocatory motion of said first and second pistons are free of spring action. Lehrke discloses the claimed invention except for specifying that the motor is an A.C. motor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an A.C. motor since it was known in the art that such motors can be used to power piston pumps.

Claim 13: Lehrke also discloses a pump wherein said first and second pistons are axially aligned (Fig. 1).

Claim 14: Lehrke also discloses a pump, said cam followers engaging said constant velocity cam at opposite ends of a diameter of the circle of rotation of said cam (Fig. 1).

Claim 15: Lehrke also discloses a pump wherein said cam followers are roller cam followers (Fig. 3, 24).

Claim 17: Lehrke also discloses a pump wherein said spring arrangement comprises brackets (20, 22) and compression springs (32) and said first and second cam followers are simultaneously urged to engage the cam surface of said constant velocity cam by said compression springs (Fig. 2).

Claim 18: Lehrke also discloses a spring arrangement comprises tension springs (32) and said first and second cam followers are directly interconnected (through the cam) by a tension spring simultaneously urging both cam followers to engage the cam surface of said constant velocity cam.

Claim 21: Lehrke also discloses a pump further comprising a reduction gearbox (section or part 12 in which gear 16 resides) interposed between the output shaft of the motor and said constant velocity cam (Fig. 1).

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke et al. (US 5,145,339) in view of Yarger (US 3,150,603).

Claim 19: Lehrke teaches the limitations of claim 12, discussed previously. However, Lehrke does not teach a pump further comprising including third and fourth pistons, cylinders, or a second cam. Yarger teaches a pump with third and fourth pistons (15-18), cylinders (11-14), and a second cam (20, 20') which operates in accordance with Applicants limitations (col. 2, lines 21-31, 56-62; col. 3, lines 20-35). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ additional pistons as taught by Yarger into the pump of Lehrke in order to increase fluid output.

Claim 20: Lehrke and Yarger teach the limitations of claim 19, discussed previously. However, Lehrke does not teach a pump further comprising a liquid discharged from said first, second, third and fourth cylinders is supplied to a common pressure loop. Yarger teaches liquid disclose from all the cylinders is supplied to a common pressure loop (Figs. 1-2).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke et al. (US 5,145,339) in view of Kettering et al. (US 1,512,029).

Claim 22: Lehrke teaches the limitations of claim 12, discussed previously. However, Lehrke does not teach a flywheel incorporated in the drive transmission.

Kettering teaches a pump which utilizes a flywheel (39). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a flywheel as taught by Kettering into the pump of Lehrke so that "energy may be stored for steadying the action of the pump" (page 2, lines 5-8).

Claim 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke et al. (US 5,145,339) in view of Krohn et al. (US 4,009,971).

Claim 23: Lehrke teaches the limitations of claim 12, discussed previously. However, Lehrke does not teach a pump wherein each piston is arranged to have a stroke of 30 to 80mm. Krohn teaches a pump which has a stroke of 1.5 inches (col. 5, lines 10-13). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ the stroke length as taught by Krohn into the pump of Lehrke in order to adapt the pump for a narrow space constraint in which the piston is allowed to oscillate.

Claim 24: and Krohn teach the limitations of claim 23, discussed previously. Lehrke also discloses a piston with a diameter of 1 inch (col. 16, line 39). Lehrke and Krohn teach the claimed invention except for a piston having a diameter between 60 and 150 mm. It would have been obvious matter of design choice to increase the size of the piston diameter as taught by Lehrke, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237, (CCPA 1955).

Claims 27-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reese et al. (US 5,195,879) in view of Krohn et al. (US 4,009,971) and in further view of Myers (3,471,079).

Claim 27: Reese discloses a pump comprising first and second cylinders (16, 18); first and second axially aligned pistons (20, 22) reciprocable rectilinearly, an electric motor (col. 16, line 25) having a rotary output shaft; a constant velocity cam (10) coupled to said rotary output shaft; and first and second cam followers (66, 68) coupled to said first and second pistons, respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons within their respective cylinders. However, Reese does not specify that the motor is an A.C. motor. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an A.C. motor since it was known in the art that such motors can be used to power piston pumps. Reese also does not disclose that the pistons reciprocate through a stroke of between 30mm and 80mm. Krohn teaches a pump which has a stroke of 1.5 inches (col. 5, lines 10-13). It would be obvious to employ the stroke length as taught by Krohn into the pump of Reese in order to increase the output of the pump. Reese also does not disclose a guide rail. Myers teaches a guide rail (48). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a guide rail as taught by Myers in order to maintain the motion of the pump in the horizontal direction (col. 3, lines 65-67). Reese also discloses a piston with a diameter of 1 inch (col. 16, line 39). Reese and Krohn teach the claimed invention except for a piston having a diameter between 60 and 150 mm. It would have

been obvious matter of design choice to increase the size of the piston diameter as taught by Reese, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237, (CCPA 1955).

Claim 28: Reese, Krohn and Myers teach the limitations of claim 27, discussed previously. Reese also discloses a pump wherein said first and second pistons have reciprocatory motion 180° out of phase with one another (Fig. 1).

Claim 29: Reese, Krohn and Myers teach the limitations of claim 27, discussed previously. Reese does not disclose two rails or first and second follower sliders. Myers teaches two rails (48) as well as first and second follower sliders (50).

Claim 31: Reese, Krohn and Myers teach the limitations of claim 27, discussed previously. Reese also discloses a pump further comprising a tension spring (28, 30) for simultaneously urging both said cam followers toward each other to engage the cam surface of said constant velocity cam. The fact that Reese does not disclose the tension springs connecting cam follower sliders is immaterial since such placement of the tension springs in the pump is a matter of design choice so long as the chief function of the springs (to urge both cam followers toward each other) is maintained.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reese et al. (US 5,195,879) in view of Krohn et al. (US 4,009,971) and Myers (3,471,079) and in further view of McIlroy (US 3,369,532).

Claim 30: Reese, Krohn and Myers teach the limitations of claim 29, discussed previously. Reese does not disclose a captive ball joint for a cam follower. McIlroy

teaches a captive ball joint (32) for a cam follower. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a ball joint as taught by McIlroy into the pump of Reese in order to simplify the connection design (i.e., reduce the number of parts since an extra pin or fixing bolt would not be necessary).

Claim 32: Newly submitted claim 32 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the alternate fastening system between the sliders depicted in claim 32 (Fig. 4) has twice as many springs as the system in the original embodiment, the spring tensions in the alternate system can be manually adjusted while the original embodiment cannot, and the alternate system has an adjustable limit structure (bolts) which determine how far apart the two sliders can be (i.e., the bolts ensure that the sliders do not drift too far apart) while the original embodiment has no such limiting structure. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 32 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

Applicant's arguments with respect to claims 12-15, 17-24 and 27-32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **NATHAN ZOLLINGER** whose telephone number is **571-270-7815**. The examiner can normally be reached on Monday - Thursday, 9 a.m. - 4 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on **571-272-7118**. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Z./
Examiner, Art Unit 3746

/Devon C Kramer/
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